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***The Debut of Gramm-Rudman***

# Reagan '87 Budget Calls for Big Increase in R&D

The President has long enthused over research as the elixir of industrial and military prowess. As if that weren't enough, he reported in his recent State of the Union address that "Today, physicists peering into the infinitely small realms of subatomic particles find reaffirmations of religious faith." Mr. Reagan did not elaborate; his Acting Science Adviser, John P. McTague, a physical chemist, declined to provide a citation.

Meanwhile, the Congress, egged on by constituents who regard laboratories as replacements for dying factories, is increasingly fond of research spending, even beyond Mr. Reagan's desires. The result is that in the supposedly dire first year of the Gramm-Rudman process, a senior federal research administrator recently quipped, "What's Gramm-Rudman?"

The jestful inquiry followed the release on February 5 of the President's budget for fiscal 1987 (which begins October 1). Military programs, as usual, dominate the R&D components of the spending plan, taking about 73 percent of the nearly $61 billion that the Administration wants to obligate next year for the conduct of R&D and the $1.7 billion for construction of related facilities.

The growth from this year's figures totals $9 billion, or 16 percent, an increase that's astonishing, given Washington's obsession with deficits. Defense would get all but $1 billion of that increase, but even so, obligations for basic research—mostly conducted by civilian agencies—would rise from $8 billion to $8.6 billion.

The latter figure unrealistically assumes that Congress will go along with the Administration's annual attempt to hold NIH spending at the current year's level. However, since the Reagan Administration took office, Capitol Hill has defiantly responded by giving Bethesda a total of about $1 billion beyond the presidential requests. It's likely to add money again.

The booming R&D budget may, of course, turn out to be a pipe dream that will be jarred back to reality by Gramm-Rudman's unmanned deficit-cutting machinery. But what's notable about the legislators who passed the law in the closing days of the first session of the 99th Congress is that upon coming back to Washington this month for the second session, they sounded like a bunch of hungover party-goers who are appalled at reports of what they did last night. Talk of a tax increase as a way

*(Continued on page 2)*

CONDUCT OF RESEARCH AND DEVELOPMENT
BY MAJOR DEPARTMENTS AND AGENCIES
(In millions of dollars)

| Department or agency | Obligations | | | Outlays | | |
|---|---|---|---|---|---|---|
| | *1985 actual* | *1986 estimate* | *1987 estimate* | *1985 actual* | *1986 estimate* | *1987 estimate* |
| Defense | 31,099 | 33,485 | 41,823 | 27,878 | 29,267 | 32,693 |
| Health, Human Services | 5,444 | 5,524 | 5,471 | 4,997 | 5,561 | 5,532 |
| NIH | (4,824) | (4,905) | (4,672) | (4,419) | (4,957) | (4,752) |
| Energy | 4,901 | 4,785 | 4,886 | 4,900 | 4,778 | 4,819 |
| NASA | 3,235 | 3,594 | 4,051 | 2,970 | 3,528 | 3,743 |
| NSF | 1,346 | 1,334 | 1,508 | 1,186 | 1,338 | 1,455 |
| Agriculture | 941 | 922 | 907 | 889 | 913 | 911 |
| Transportation | 430 | 364 | 277 | 417 | 416 | 331 |
| Interior | 389 | 381 | 345 | 414 | 403 | 351 |
| EPA | 320 | 334 | 310 | 275 | 318 | 332 |
| Commerce | 399 | 380 | 297 | 373 | 383 | 311 |
| AID | 210 | 206 | 203 | 204 | 208 | 209 |
| VA | 227 | 186 | 194 | 215 | 182 | 187 |
| All other | 550 | 531 | 531 | 527 | 538 | 544 |
| Total | 49,491 | 52,024 | 60,803 | 45,244 | 47,832 | 51,418 |

## In Brief

**Latest entry in the eternal struggle over runaway overhead costs on NIH research grants—the Fair Share Allocated Overhead Policy. That's the perfumed title of the Administration's new scheme to cap overhead rates by holding down the portion that can be charged to departmental administration, the fastest growing sector in the indirect-costs derby.**

*The $8.8 million, swollen by a 63-percent overhead rate on salaries, that NSF provides for studies conducted by the National Academy of Sciences is an object of increasing resentment in some of the financially hard-pressed research directorates at NSF. "We're looking at it," an Assistant Director tells SGR—with a note of malice.*

**The Institute for Scientific Information has reached an out-of-court settlement with the California firm that charged it with software piracy (SGR Vol. XV, No. 19), and ISI President Eugene Garfield says he's going ahead with his plans to publish a national weekly, *The Scientist*, based in Washington. Garfield, still under criminal investigation by a Philadelphia grand jury in connection with the software case, now plans an August debut for the paper. He says that with new executive help on board at ISI, he'll personally be involved in the paper's operations. Garfield's original partner in the venture, the British weekly *Economist*, dropped out last year.**

# . . . NSF Selects Four Areas for Expanded Support

*(Continued from page 1)*

out of Gramm-Rudman is on the rise. Op-ed commentary now plays with the theme that the malevolence of deficits has been exaggerated.

The survivability of the big R&D budget is greatly assisted by the widespread and passionate belief that federally financed research facilities and programs provide the foundation for regional economic prosperity. Until about a decade ago, only a few legislators, usually from big university towns, prowled after R&D facilities for their constituents. Today, the pursuit of federally financed laboratories is a major assignment in offices throughout Capitol Hill, where dreams persist of emulating the North Carolina Research Triangle, the Route 128 complex, and, until the recent crash, Silicon Valley.

While many state and regional organizations are putting up seed money of their own, the sought-after big bankroll for those dreams is in the federal R&D budget, in big and little items. The one that Mr. Reagan has proposed to Congress for fiscal 1987 contains many appealing goodies.

First of all, for the aerospace industry, there's the aerospace plane—the "Orient Express" announced by Mr. Reagan in the State of the Union address. Jointly sponsored by NASA and the Pentagon, it's budgeted for $200 million next year, as the first major step in a multi-billion program that aims to have a prototype flying by the mid-1990s. The plane, powered by liquid hydrogen and designed to take off from ordinary runways and fly at 100,000 to 350,000 feet at 12 to 25 times the speed of sound, is to be the basic model for a variety of military and civilian derivatives.

Can this money-gulping venture be tolerated in the Gramm-Rudman era? A "fact sheet" distributed by the White House Office of Science and Technology Policy reflects the emerging attitude toward deficit reduction. "Obviously, if the automatic [reduction] provisions occur," it states, "there will be impacts. It is on programs like this which are in the interests of the Nation that we want to work with Congress to minimize the impacts."

In terms of its place in R&D politics, the aerospace plane is a godsend for an industry which isn't sure that another mega-project, the manned space station, will actually be built. As the absurdity of the cabin in the sky becomes apparent, the criticism is mounting, and the stretch-outs of spending are ominously increasing.

At the lower end of the spending scale, there's the National Science Foundation, budgeted next year for $1.6 billion, a 13 percent rise. Financially, NSF is a pygmy on the federal landscape. But as the only federal agency whose central assignment is the support of university-based science, the Foundation is viewed with increasing affection by Congress's regional boosters. It's been a long-time since any legislative clown sought publicity by ridiculing titles of NSF-supported research. Instead, many legislators pant after NSF's prizes, such as its small but growing program of campus-based Engineering Research Centers. Six are now in existence, 3 or 4 more should be announced any day now, and the new budget may bring the total to about 15 in the coming fiscal year.

The Foundation is obviously well-regarded by the Administration, as NSF Director Erich Bloch proudly pointed out when he told a press briefing that the proposed 13-percent budget increase "comes in a year when the Administration is seeking to reduce the deficit and move closer to a balanced budget."

Bloch, the most decisive chief that NSF has had in years, or maybe ever, announced that 4 areas have been selected for substantial budget increases:

- Biotechnology, up $20 million, to a total of $106.5 million. Bloch said the fundamental research base underpinning biotechnology commercialization is "alarmingly thin in many new areas."
- Computational Science and Engineering, up $27 million, to a total of $84 million. Bloch emphasized that the aim is "not computer research, but expanded use of computers in tackling fundamental problems in science and engineering." The money will support creation of new interdisciplinary teams, enhancement of existing centers, training and provision of equipment.
- Global Sciences Research, up $18 million, to a total of $35.6 million, with emphasis on orchestrating various research and observational techniques so as to "treat the earth as an integrated system of physical processes."
- Broadened Participation in Science and Engineering Research and Education. No big bucks here, but a bit more for upgrading the standing of groups that haven't been able to compete effectively for NSF awards. The Experimental Program to Stimulate Competitive Research will double, to $4 million, and will be extended to schools in 8 states. And $4 million will be allocated for a new Minority Centers of Excellence Program. Meanwhile, funds for undergraduate research and education will increase by $13 million, to a total of $63 million.

For physics, the good news from the Department of Energy is that additional funds will be provided to finance longer working hours at DOE's major particle accelerator facilities. And groundbreaking has been authorized for the Continuous Electron Beam Accelerator Facility, at Newport News, Va., and the 1-2 Gev Synchrotron at the Lawrence Berkeley Laboratory. The Superconducting Super Collider continues in the design phase, with the question of go or no-go at least a year or two away. As expected, fusion research—psychologically undercut by what looks like a long-running oil glut—is to be cut again, with emphasis refocused on basic research, rather than hardware engineering.

*(Continued on page 3)*

# Shuttle Inquiry: Working Under a Narrow Mandate

Organized more for public relations than for a disinterested autopsy on a colossal technological failure, the shuttle inquest is off to a bumbling start. As NASA's managers bunker down into what's known among Washington bureaucrats as the C.Y.A. (cover your ass) mode, the true measure of trust in the presidential commission is the gusher of press leaks that have provided the weightiest evidence of what went wrong.

The 13 members appointed so far to the presidential commission can't be faulted for professional accomplishment or dedication to public service. But their mandate is limited to investigating the Challenger crash, rather than looking into the precarious fundamentals of the shuttle program, an audacious highwire act that finally ran out of luck.

In addition, the commissioners are by and large the wrong bunch for penetrating the intricacies of NASA's self-protective culture and producing the golden product that the space program desperately needs: A report that will eliminate any plausible doubts concerning what happened, who's to blame, and whether the shuttle should fly again.

The commissioners, headed by former Secretary of State William P. Rogers, are either, like him, so remote from the shuttle program that they know little about it, or they're so closely involved with it that their enthusiasm is overflowing. Their varied backgrounds and interests suggest they'd make a fine jury. But they're not supposed to be hearing the results of an investigation, as would a jury. Rather, they're supposed to be conducting an independent investigation of disaster in a highly technical enterprise.

As can be seen from the list on page 4, the commission is long on aerospace celebrities, man-in-space enthusiasts, and executives of aerospace firms doing business with the government; it's short on independent high-tech expertise relevant to the matter under investigation.

On the crucial matter of staff, the commission has moved sluggishly. Appointment of 12 members of the commission was announced February 3, one week after the shuttle explosion, and the first public hearings were held over the next few days. Selection of an Executive Director wasn't announced until February 10. The appointee is Alton G. Keel Jr., who's on the staff of the Office of Management and Budget as Associate Director for National Security and International Affairs. He previously served at the Defense Department as Assistant Secretary of the Air Force for Research, Development, and Logistics.

The boundaries of the inquiry have been circumscribed by the President's repeated assertions that the shuttle program is to proceed. With the presidential verdict already in, the theme is being echoed by NASA's chief, Acting Administrator William R. Graham,

*(Continued on page 4)*

## . . . $2 Billion Increase Sought for Star Wars Program

*(Continued from page 2)*

Spending plans for NASA are altogether uncertain until the future of the Shuttle is settled, but one major new research project was included in the 1987 budget—commencement of a 3-year collaboration with France for a study of oceanography from space.

The Defense Department's R&D plans call for raising the budget for the Strategic Defense Initiative from the present $2.8 billion to $4.8 billion. The lower figure reflects Congress's unwillingness last year to go full throttle on SDI—the Administration wanted $1 billion more than it got. Of special interest to academe is DOD's University Research Initiative, which is up or down, depending on your perspective. The Administration sought $25 million for this year's program; Congress appropriated $100 million late in the session. DOD says it will be able to spend only $75 million of that approrpriation, and will carry over the balance to 1987, for which it is asking only $50 million for URI.

R&D spending by civilian agencies was automatically nicked 3.7 percent this year in the first stage of the Gramm-Rudman process. The R&D budget for next year was apparently written in the expectation that R&D, military and civilian, will grow while other programs take a beating to meet the requirements of deficit reduction. Is that politically possible? At this stage, any answer would be plain speculation about what lies ahead in the uncharted territory of Gramm-Rudman.

DOD's exemption from spending cuts has stirred major opposition, and that will extend to Defense R&D when Congress gets down to the fine details. But what's notable about the generally privileged treatment of civilian R&D is that it has not aroused hostile attention.—DSG

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# . . . Strife Raging Between Old and New NASA Chiefs

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who insists that the shuttle is an "operational system" that went awry just once in 25 flights. With shuttle flight crews numbering 5 to 7, the odds are thus worse than Russian roulette.

"We don't look like we're going to have to go back to the design process again and envision reconfiguring the system or making a very major fundamental design change," Graham said after the White House announced that the investigation NASA had started would be supplanted by the presidentially appointed commission.

The Acting Administrator made these statements during a timeout from his bloody battles with the man he was appointed to replace, if only temporarily—James M. Beggs. It turns out that Beggs has been hanging around NASA headquarters in a leave status ever since he stepped down in December, following his indictment for contract fraud allegedly committed while he was working for General Dynamics prior to his appointment to NASA in 1981.

The White House is reported to have asked Beggs to stay on to coach Graham, who's eager for a full-fledged appointment. Acting Administrator Graham is also obviously so eager to widen the distance between himself and Beggs that he wouldn't let Beggs and his wife ride a NASA aircraft to the Challenger memorial service in Houston. Beggs, who was attentive to Congressional relations and well-regarded on Capitol Hill, hitched a ride with a planeload of Congressional leaders.

In defiance of the usual rules of investigatory proceedings, NASA is both the object of the investigation and a participant in the conduct of it. The official supply of evidence for the commission comes from NASA, though the gusher of leaks to the press suggests that there are people in and around the strife-torn agency that don't trust its intentions. The biggest break so far in the investigation—the revelation of ominous concerns and warnings of failure about the sealing rings on the booster rockets—came from a leak to the *New York Times*.

The flow of information has also been rendered suspect by a rigorously enforced NASA news blackout and the investigating commission's oscillation between public and secret sessions. The secrecy is explained on the grounds that it will encourage candor—a foolish notion that was long ago discarded by the judicial system. There's nothing like the glare of public attention to make a sworn witness tell the whole truth.

We're also getting, and with justification, knowledgeable public expressions of skepticism about the quality of the investigation. Typical of them is a letter to the *Times* from a veteran rocket designer, Martin Summerfield, professor of engineering emeritus at Princeton University and president of Princeton Combustion Research Laboratories. None of the appointees to the commission, he noted, "have had any involvement in the engineering of solid-propellant rocket boosters, the prime suspect at this time."

Nothing precludes additional appointments that would equip the commission with the kind of independent expertise that would help assure a thorough investigation.

This administration is unprecedented for deft management of public sentiment and opinion. Mr. Reagan's performance at the rites for the shuttle's seven crew members was somber and inspirational. The appointment of a presidential commission—traditional for dealing with great catastrophes—quickly followed, with the President saying he wanted a "calm and deliberate assessment of the facts." But careers, reputations, and huge contracts are at stake in the investigation of the shuttle crash, and it's all against a background of a rigid commitment to manned spacecraft as the centerpiece of US activities in space. From this mix, there arises a telltale aroma of public-relations management.

These are opening days of a long inquiry, and perhaps the outcome will be a solid performance that merits public confidence. But on the basis of what's happened so far, there's ample reason to believe that the White House is more concerned with imagery than with engineering.—DSG

*Members of the presidential commission investigating the shuttle explosion:*

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William P. Rogers, Chairman, Secretary of State under Nixon, in law practice in New York.

David C. Acheson, Senior Vice President of Comsat, 1967-74, in law practice in New York.

Neil Armstrong, first man on the moon, Chairman of Computing Technologies for Aviation, Inc., Charlottesville, Va.

Eugene E. Covert, Professor of Aeronautics, MIT, consultant to NASA.

Richard P. Feynman, Nobel laureate Professor of Theoretical Physics, Caltech.

Robert B. Hotz, editor of *Aviation Week,* 1953-80.

Maj. Gen. Donald J. Kutyna, Director of DOD's space shuttle program, 1982-84, Director of Air Force Space Systems and Command, Control, and Communications.

Sally Ride, first American woman in space.

Robert W. Rummel, aerospace engineer, former Vice President, TWA, President, Robert W. Rummel Associates, Mesa, Ariz.

Joseph F. Sutter, Executive Vice President, Boeing

Arthur B. C. Walker Jr., Professor of Applied Physics, Stanford

Alfred D. Wheelon, Group President, Space and Communications, Hughes Aircraft Co.

Chuck Yeager, retired Air Force test pilot.

# Academic R&D Support: Top-50 List Rarely Changes

*Science-policy debate in Washington rings with complaints that the federal research-grant system unfairly assures that the rich universities get richer. The very rich ones reply they are receiving funds awarded on merit that was initially home-financed. They contend that in recent years other universities have bootstrapped themselves into effective competitors for grant money and that the gripers should pursue self-improvement as a first step toward attracting more federal funds.*

*The top 50 university recipients of federal R&D money regularly receive about two-thirds of the total going to academe—$3.7 billion of the $5.6 billion awarded in 1984. The evidence shows that there's some mobility off and onto the list—but not much.*

*To track the ups and down of federal R&D money for universities, SGR prepared the following comparisons from NSF's annual listings of federal obligations for academic R&D in 1975 and 1984 (the latest year for which data are available). Only 6 universities on the 1975 list failed to make the top 50 in 1984—the University of Miami, Colorado State, Princeton, Mt. Sinai (NY) School of Medicine, the University of Hawaii, and the University of Texas Cancer Center. But the fall from grace wasn't too far—just down to the range of the top 56 to 80 academic recipients of R&D money. A note: The incongruous $467,000,000 that puts Johns Hopkins at the top of the 1984 list comes mainly from its management of the Navy's Applied Physics Lab.*

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**1975**

| | |
|---|---|
| 1 MIT | $68,655,000 |
| 2 U of Wash | 60,189,000 |
| 3 Stanford | 58,391,000 |
| 4 UCLA | 54,123,000 |
| 5 U Wisc.-Mad | 49,118,000 |
| 6 Harvard | 48,532,000 |
| 7 UC San Diego | 48,523,000 |
| 8 Columbia | 48,235,000 |
| 9 U of Penn | 43,390,000 |
| 10 Johns Hopkins | 41,238,000 |
| 11 UC Berkeley | 40,357,000 |
| 12 U of Minnesota | 39,695,000 |
| 13 Cornell | 39,578,000 |
| 14 U of Michigan | 38,403,000 |
| 15 U of Chicago | 38,082,000 |
| 16 Yale Univ | 36,601,000 |
| 17 U Illinois-Urb | 33,841,000 |
| 18 UC San Fran | 33,689,000 |
| 19 Washington U | 30,679,000 |
| 20 USC | 28,660,000 |
| 21 NYU | 27,994,000 |
| 22 U of Rochester | 25,371,000 |
| 23 Yeshiva | 24,782,000 |
| 24 Duke Univ | 24,426,000 |
| 25 U Texas-Austin | 23,307,000 |
| 26 U of Miami | 22,896,000 |
| 27 U of Colorado | 22,270,000 |
| 28 Purdue | 21,236,000 |
| 29 Caltech | 20,995,000 |
| 30 Ohio State | 20,913,000 |
| 31 Penn State | 20,211,000 |
| 32 UC Davis | 19,837,000 |
| 33 U of Utah | 19,726,000 |
| 34 U NC Chapel Hill | 19,102,000 |
| 35 Case Western R | 18,808,000 |
| 36 Northwestern | 18,655,000 |
| 37 Baylor Medicine | 18,615,000 |
| 38 U of Pittsburgh | 18,512,000 |
| 39 Michigan State | 17,924,000 |
| 40 U of Iowa | 16,645,000 |
| 41 U of Florida | 16,206,000 |
| 42 Colorado State | 16,085,000 |

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**1984**

| | |
|---|---|
| 1 Johns Hopkins | 467,050,000 |
| 2 MIT | 178,706,000 |
| 3 Stanford | 160,274,000 |
| 4 U of Washington | 136,803,000 |
| 5 Columbia Univ | 110,089,000 |
| 6 UCLA | 110,057,000 |
| 7 Cornell | 105,338,000 |
| 8 UC San Diego | 104,083,000 |
| 9 U Wisconsin-Mad | 99,831,000 |
| 10 Harvard | 98,972,000 |
| 11 Yale | 97,905,000 |
| 12 U of Michigan | 95,307,000 |
| 13 U of Penn | 94,154,000 |
| 14 UC Berkeley | 85,852,000 |
| 15 UC San Fran | 85,449,000 |
| 16 USC | 79,617,000 |
| 17 U of Minnesota | 72,494,000 |
| 18 U Illinoia-Urb | 68,911,000 |
| 19 U of Chicago | 68,703,000 |
| 20 Penn State | 64,372,000 |
| 21 U of Colorado | 62,708,000 |
| 22 U Texas-Austin | 62,316,000 |
| 23 Duke | 62,074,000 |
| 24 Washington Univ | 61,341,000 |
| 25 U of Rochester | 60,157,000 |
| 26 NYU | 55,028,000 |
| 27 Yeshiva | 53,077,000 |
| 28 U of Pittsburgh | 50,557,000 |
| 29 Caltech | 48,589,000 |
| 30 U NC Chapel Hill | 48,491,000 |
| 31 U of Iowa | 48,378,000 |
| 32 Ohio State | 48,339,000 |
| 33 U of Utah | 45,427,000 |
| 34 Case Western | 43,931,000 |
| 35 U of Arizona | 43,380,000 |
| 36 Northwestern | 42,864,000 |
| 37 Purdue | 41,892,000 |
| 38 Michigan State | 41,205,000 |
| 39 U of Florida | 40,847,000 |
| 40 Woods Hole | 39,705,000 |
| 41 Baylor Medicine | 39,340,000 |
| 42 Boston Univ | 39,306,000 |

*(Continued on page 6)*

# Britain Wondering What It Got in Star Wars Deal

*London.* Against a backdrop of Western European skepticism about Star Wars, Britain was the first, and so far the only, foreign nation to follow the Pentagon's urgings to sign on as a participant in research on the missile-defense scheme. But now that the American SDI managers have acquired their first eagerly sought-after foreign political endorsement, there's increasing puzzlement in the UK concerning the role this country is to play in the SDI program.

The UK-US signing, which took place in December, presumably sets out terms for transferring SDI technology between the 2 countries and addresses the sensitive issue of commercial rights from work performed in the UK. But neither the Pentagon nor the Ministry of Defense has disclosed the exact terms of the agreement. And not even the British industrial firms negotiating for contracts have been advised of the contractual ground rules. Their executives say that the best they have are hints that some veils may be lifted when British firms are close to final agreement with the SDI organization or American prime contractors.

Britons have learned to expect the secrecy obsession of their government departments, and usually take it in stride. But the blackout of details of the SDI deal is causing some unusual rankling. The country's economic woes have focused political and public attention on the commercial value of advanced technology. Opposition MPs have complained that the secret deal might require British firms to give the US their research products without getting proper recompense. Officials of British industrial firms have warned that, without knowing the content of the inter-governmental agreement, they're negotiating in the dark. "I won't be able to sign a final document if I don't know the terms," said William Bardo, Technical Director of Marconi, one of the leading UK companies in negotiations with SDI.

Never at a loss to conjure up explanations for its devotion to secrecy, the Defense Ministry insists the SDI accords must remain under wraps because disclosure might provide a competitive advantage for other countries that the Pentagon hopes to lure into SDI research agreements, prominent among them West Germany and Italy. If they knew the details of the UK's agreement, says the Ministry, they might insist on a better deal for themselves. What's left out is that, not knowing the details of the US-UK agreement, they might also insist on a better deal for themselves.

Since the signing, teams from the SDI have held meetings in Britain at which Defense Ministry officials and industrial representatives described skills and specialties that they say they can provide for the program. With no skittishness here about government and industrial research organizations joining forces to get SDI contracts, joint undertakings are likely to figure in Britain's involvement with the program.

Thus, a proposal for development of electromagnetically powered rail guns has been entered by a consortium that consists of International Research and Development (owned by NEI, a big engineering firm), the UK Atomic Energy Authority's Culham Laboratory, Rolls-Royce, and the Defense Ministry's Royal Armaments Research Laboratory. Meanwhile, a proposal for development of "battle-management" software is the work of an all-industry group made up of Systems Designers, CAP, Marconi, Plessey, and Ferranti.

One possibility said to be under consideration here as a joint UK-SDI venture is construction of a major computer network to simulate space battles related to Europe's strategic position. Of particular interest is defense against short-range missiles, landbased and submarine launched. The European network would complement a similar facility planned in the US—the National Test Bed—for which SDI has invited proposals.

The prospect of getting in on the money and technological excitement of SDI is obviously appealing to British industry. But it's becoming evident that the political understanding—whatever it amounts to—has not provided the slightest advantage for the UK firms, let alone an inside track. According to David Martin, who looks after foreign relations for the SDI organization, proposals from the UK will have to compete with those from US contractors.

"We are having a comprehensive technical dialog with the UK," Martin says. "But turning specific proposals into contracts is not just a matter of 2 people sitting across a table and talking. It is a long and complicated process which may take months to settle."

The UK's aspirants for roles in Star Wars research also find themselves confronted by restrictions that the Pentagon has imposed on foreign subcontracting by

*(Continued on page 7)*

## *University R&D*

*(Continued from page 5)*

| | | | |
|---|---|---|---|
| 43 | U of Arizona | 16,067,000 | |
| 44 | Princeton | 16,012,000 | |
| 45 | U Alabama, Birm | 15,507,000 | |
| 46 | Mt. Sinai Med | 15,507,000 | |
| 47 | U Hawaii-Manoa | 15,029,000 | |
| 48 | U Tex Cancer Ct | 14,881,000 | |
| 49 | Woods Hole | 14,384,000 | |
| 50 | Vanderbilt | 13,735,000 | |
| 43 | Georgia Tech | 38,460,000 | |
| 44 | U Md. College Pk | 38,260,000 | |
| 45 | U Alabama, Birm | 37,839,000 | |
| 46 | UC Davis | 37,586,000 | |
| 47 | Oregon State | 37,499,000 | |
| 48 | Vanderbilt | 35,338,000 | |
| 49 | Indiana | 35,123,000 | |
| 50 | U New Mexico | 33,842,000 | |

# In Print: Red Tape, Chemistry, Lab Animals, Etc.

**From the National Academy of Sciences, Government-University-Industry Research Roundtable, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 202/334-3486:**

*Reducing the Bureaucratic Accretion in Government and University Procedures for Sponsored Research,* 192 pages, no charge (limited supply), summary and papers from a handwringing fest in June 1985 at the Academy, at which everyone agreed that the federal R&D-support system is muscle-bound; the usual remedies were proposed, ranging from "increased oral communication between scientific and program officers and prospective proposers of research," to longer funding periods and greater tolerance for shifting around granted funds.

**From the NAS Board on Chemical Sciences; tel. 202/334-2156:**

*Selected Opportunities for Chemical Research Related to the Navy's Mission,* 26 pages, no charge, report by the Academy's Committee on Office of Naval Research Chemical Science Research Planning, chaired by George W. Parshall, of du Pont, recommends that ONR undertake long-term chemical research programs in surfaces and interfaces, design of materials for information storage, reliability and integrity of materials, materials under intense laser radiation, combustion in enclosed spaces, and process control and non-destructive evaluation.

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**From the American Association of Engineering Societies, 415 2d St. NE, Suite 200, Washington, DC 20002; tel. 202/546-2237:**

*Engineering and Technology Degrees 1985,* 9th edition, complete set $120 for AAES members, $200 for non-members, a 3-volume compilation of degree data for US engineering education, including curriculum and minority enrollments.

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**By the Congressional Office of Technology Assessment, available from the Superintendent of Documents, USGPO, Washington, DC 20402:**

*Alternatives to Animal Use in Research, Testing, and Education* (GPO Stock No. 052-003-01012-7), 441 pages, $16, filled with previously scattered or unavailable data, this report is likely to stand for a long time as the common reference source on the emotion-stirring issue of experimental animals; its main conclusion: only very limited alternatives exist at present for replacing animals, but some uses can be reduced or eliminated and many procedures can be made more humane.

*Technology and Structural Unemployment* (GPO Stock No. 052-003-01017-8), 445 pages, $15, reports that 11.5 million US workers lost their jobs between 1979-84, that over 2 million experienced long-term unemployment, while half who found new jobs took cuts in earnings; also that only 5 percent of eligible displaced workers are being assisted by federal programs intended to provide training for new jobs.

## *SDI* *(Continued from page 6)*

American firms that have been awarded SDI contracts. The long-term durability of these barriers isn't known, but for the present, they're adding to the wonder about the value of the deal that the government struck with SDI's eager salesmen.

Bob Fisette, Brussels-based Vice President of Martin Marietta, says the Pentagon has told his company not to sign SDI agreements with foreign companies without first receiving the Pentagon's approval of procedures for controlling transfer of sensitive technologies. The indications here are that American SDI contractors will be required to obtain the Pentagon's case-by-case approval of all foreign subcontracting, and that, the US-UK agreement notwithstanding, the process extends to British firms, too.

In addition to holding several SDI contracts, Martin Marietta is one of 5 US companies that have been awarded $5-million "architecture" contracts to design the basic shape of an operational missile-defense system. The UK firms that the American company is talking to include Hunting Engineering, which specializes in aerospace engineering and guided weapons; Logica, a software firm; Dowty, energy systems, and Thorn EMI, battle-management systems and sensors.

High-tech industry here pressed the government to accept SDI's warm invitation to join the program, and the firms are hungry to get a share of the work. The snail's pace that has persisted since the well-publicized signing of the accord last December is inspiring more than a little concern about SDI's motives for the courtship.—Peter Marsh

(The writer is technology correspondent for the London *Financial Times.)*


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# Another Nutrition Study Planned by the Academy

Diet and health, a source of political bellyaches at the National Academy of Sciences in recent years, is again to be the subject of a big study at the NAS.

Chaired by Arno G. Motulksy, Director of the Center for Inherited Diseases, University of Washington, the study will examine scientific evidence about nutrition and suggest dietary guidelines. Conducted by the NAS Food and Nutrition Board, it is expected to take 3 years and cost $1.8 million, which has been provided by the Henry J. Kaiser Family Foundation, the W. K. Kellog Foundation, the Medical Trust, the Fannie E. Rippel Foundation, Occidental Petroleum, and the Academy itself.

An announcement of the study noted that it is separate from the Food and Nutrition Board's periodic production of Recommended Dietary Allowances. Amid much internal rancor and unfriendly news reports, last year's update of the RDA's was aborted by NAS President Frank Press when its conclusions seemed to conflict with NIH's prescriptions for deterring heart disease and cancer with low-fat diets and vitamin A. In this case, the Academy was accused of ignoring the paucity of scientific evidence on diet and health and caving in to the granola crowd.

Under Press's predecessor, the late Philip Handler, the situation was just the opposite. Handler was accused in Congress of loading the Food and Nutrition Board with industry moles who produced a report that disputed the case against fat.

## *International Nutrition Study*

Meanwhile, another item of nutrition-research news: An 11-nation study of "biologically important" trace elements has gotten underway, with the Vienna-based International Atomic Energy Agency serving as coordinator. US agencies involved are the National Bureau of Standards, the Food and Drug Administration, and the Department of Agriculture. NBS is responsible for developing analytical methods for the overall study and also for assuring quality of data collection. Additional information is available at NBS from John Henkel, 301/921-3181.

## *NCI Expands IL-2 Trials*

Six cancer centers have been selected by NIH to treat advanced cancer patients with interleuken-2 and so-called killer cells, an immune-stimulating therapy that stirred hysterical worldwide attention when it was publicly announced late last year.

The centers have been awarded approximately $500,000 each to treat a a total of about 300 patients this year, about 4 per month at each center. Treatment was previously limited to 4 to 8 patients at the government's Frederick Cancer Research Facility. The 6 recipients: New England Medical Center; Montefiore Medical Center/Albert Einstein College of Medicine; Loyola University Medical Center; U of Texas Health Science Center/Audie Murphy Veterans Administration Hospital, San Antonio; Cancer Research Institute of the Medical Center, UC San Francisco; City of Hope National Medical Center.

## *NAE Picks Executive Officer*

William C. Salmon has been appointed Executive Officer of the National Academy of Engineering, succeeding Hugh Miller, who will head a new NAE Office of External Affairs responsible for the NAE's "expanding public awareness and development activities." Salmon came to the Academy from the State Department, where he was Senior Adviser for Science and Technology to the Under Secretary for Security Assistance, Science and Technology.

## *Science Week Set for May 11-17*

May 11-17 has been designated as the second annual National Science Week. It's intended to spur public interest in science through displays and discussions of research activities. Coordination is by NSF, with support from industry and the involvement of schools and professional organizations throughout the country. For information from NSF: Mary Keeney, 202/357-9838.

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